

**1295329**

(21) Application No. 53241/70 (22) Filed 9 Nov. 1970  
(31) Convention Application No. 16656 (32) Filed 10 Nov. 1969 in  
(33) Switzerland (CH)  
(45) Complete Specification published 8 Nov. 1972  
(51) International Classification C08G 30/10 D06M 15/52  
(52) Index at acceptance



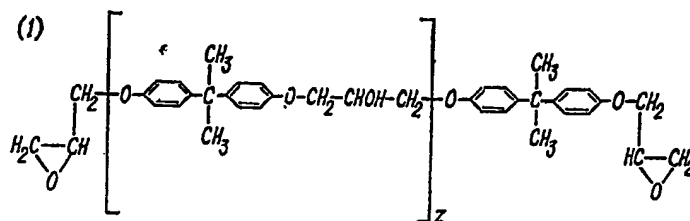
(54) PREPARATIONS OF REACTION PRODUCTS OF EPOXIDES, POLYMERIC FATTY ACIDS AND BASIC POLYAMIDES, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

5 The present invention provides a process for the manufacture of a stable preparation comprising a reaction product of a polyepoxide, polymeric fatty acid and a basic polyamide, which comprises reacting a) a reaction product of at least a') at least one polyepoxide which contains at least two epoxide groups per molecule, and a'') at least one polymeric, unsaturated fatty acid, the equivalent ratio of epoxide groups to acid groups being from 0.5:1 to 0.95:1, with b) a basic polyamide which is obtained by condensation of b') a polymeric, unsaturated fatty acid and b'') a polyalkylenepolyamine, in the presence of an organic solvent, at a temperature of 40 to 120°C, the equivalent ratio of acid groups of component a) to amino groups of component b) being from 1:0.4 to 1:6.

10 By one "amine equivalent", there is to be understood the amount of basic polyamide in grams which is equivalent to one mmol of monoamine.

15 The polyepoxides a') from which the component a) is obtained are preferably derived from polyhydric phenols or polyphenols, such as resorcinol, and phenol-formaldehyde condensation products of the resol or novolak type. In particular, bisphenols such as bis-(4-hydroxyphenyl)-methane and above all 2,2-bis-(4'-hydroxyphenyl)-propane are preferred as starting compounds for the manufacture of the polyepoxides.

20 Polyepoxides of 2,2-bis-(4'-hydroxyphenyl)-propane, which possess an epoxide content of 1.8 to 5.8 epoxy group equivalents/kg, but preferably at least 5 epoxy group equivalents/kg, and which correspond to the formula



wherein  $z$  denotes an average number having a value of 0 to 0.65, may be particularly mentioned. Such polyepoxides are obtained by reaction of epichlorohydrin with 2,2-bis-(4'-hydroxyphenyl)-propane.

6/23/06, EAST Version: 2.0.3.0

Aliphatic, ethylenically unsaturated dimeric to trimeric fatty acids have proved to be very suitable components a''). Preferably, the reaction products a) are manufactured from the epoxides a') and aliphatic unsaturated dimeric to trimeric fatty acids a''), which are derived from monocarboxylic acids with 16 to 22 carbon atoms. These monocarboxylic acids are fatty acids with at least one, but preferably 2 to 5, ethylenically unsaturated bonds. Representatives of this class of acids are for example oleic acid, linoleic acid, eleostearic acid, licanic acid, arachidonic acid, clupanodonic acid and especially linoleic acid and linolenic acid. These fatty acids can be obtained from natural oils, wherein they occur above all as glycerides.

The dimeric to trimeric fatty acids a'') used according to the invention are obtained in known manner by dimerisation of the specified monocarboxylic acids. The so-called dimeric fatty acids always contain some trimeric acids and a small amount of monomeric acids.

Dimerised to trimerised linoleic acid or linolenic acid are particularly suitable as component a''). The technical products of these acids as a rule contain 75 to 95 per cent by weight of dimeric acid, 4 to 25 per cent by weight of trimeric acid and from a trace to 3% of monomeric acid. Accordingly, the molar ratio of dimeric to trimeric acid is about 5:1 to about 36:1.

The reaction of the component a') with the component a'') is appropriately carried out at 110 to 160°C, preferably 150°C.

The ratio of polyepoxides a') to acids a'') in component a) is so chosen, according to the invention, that an excess of acid is used, so that there is fewer than one epoxide group per each carboxyl group of the acid. The reaction products a) hence contain carboxyl end groups. According to the invention, the amount of the components a') and a'') should be fixed in such a way that there is an equivalent ratio of 1 acid group to 0.5—0.95 epoxide group, that is to say the amount of acid which corresponds to one acid group equivalent is reacted with the amount of epoxide which corresponds to an epoxide group equivalent of 0.5 to 0.95. Preferably, the equivalent ratio of epoxide groups to acid groups is 0.8:1 to 0.95:1.

The polymeric unsaturated fatty acids used as component b') for the manufacture of the basic polyamides b) correspond to the fatty acids used as component a'').

Suitable components b'') are above all polyamines such as diethylenetriamine, triethylenetetramine or tetraethylenepentamine, that is to say amines of formula



wherein n is equal to 1, 2 or 3.

In the case of amine mixtures, a non-integral average value is also possible, for example between 1 and 2.

The use of a basic polyamide of dimerised to trimerised linoleic acid or linolenic acid and a polyamine of formula (2) is particularly interesting.

Possible organic solvents in the presence of which the reaction of the component a) with b) occurs are above all water-soluble organic solvents, and in particular those which are miscible with water in all proportions. Dioxane, isopropanol, ethanol and methanol, ethylene glycol-n-butyl ether (=n-butylglycol) and diethylene glycol-mono-butyl ether may be mentioned as examples.

At the same time it is however also possible to carry out the reaction in the presence of water-insoluble organic solvents, for example in petrol hydrocarbons such as petrol or petroleum ether, benzene, halogenated benzenes or benzenes substituted by lower alkyl groups, such as toluene, xylene and chlorobenzene; alicyclic compounds such as tetralin or cyclohexane; and halogenated hydrocarbons such as methylene chloride, methylene bromide, chloroform, carbon tetrachloride, ethylene chloride, ethylene bromide, s-tetrachloroethane, 1,1,1-trichloroethane and above all trichloroethylene or perchloroethylene.

The reaction products thus obtained are insoluble in water, or can at most be dispersed in water.

The reaction is advantageously carried out at temperatures of 40 to 80°C, especially at 60 to 70°C. The solutions or dispersions obtained in this reaction are appropriately adjusted to a content of 10 to 30 per cent by weight of reaction product by dilution with an organic solvent. They are distinguished by high stability.

The stable preparations obtained according to the invention can be used for various purposes, above all for finishing textiles. In particular, they are suitable for rendering wool non-felting. Here the textiles are treated with a preparation which contains, dispersed in a water-insoluble organic solvent, a reaction product of polyepoxides, polymeric fatty acids and basic polyamides as set out above, and a surface-

active dispersing agent which is readily soluble in organic solvents, and subsequently the solvent is removed from the textiles thus treated and, optionally, the textiles are then subjected to an aftertreatment, for example, by storing at room temperature (i.e. 15° to 25°C) for a period of from, for example, 2—10 days or to a heat treatment at elevated temperature, if appropriate.

Preferably, the exhaustion process is used. As a rule it suffices to allow the preparation for the nonfelting treatment to act on the textiles for 15 to 60 minutes at a temperature of 20 to 80°C, preferably 30 to 50°C. An addition of a low molecular (generally of 1 to 4 carbon atoms) aliphatic carboxylic acid, such as for example formic acid or acetic acid, to the treatment bath at a concentration of up to 20 ml/litre has proved appropriate in many cases. It is advantageous if, following this treatment and after removal of the solvents from the treated textiles, the textiles are subjected to an aftertreatment, for example by storing for a period of from 2—10 days or to a heat treatment at, preferably, 40 to 100°C, especially 80°C, for 60 to 15 minutes, especially 60 minutes.

If desired, the preparation which is used for the finishing treatment can contain further additives, such as other textile finishing agents, for example optical brighteners or agents for imparting a soft handle.

Further, a combined process for dyeing wool and rendering it non-felting is also possible, in which, simultaneously or successively and in optional sequence, using the exhaustion method, the wool is on the one hand dyed and on the other treated with the preparations according to the invention. Dyeing and rendering non-felting can hence be combined in a simple manner and be carried out in the same apparatus without the wool having to be taken out of the apparatus between the two processes.

Dyeing can be carried out in known manner, with any desired dyestuffs which can be used for wool. Equally, the additives which are customary when dyeing wool can be used, such as levelling agents, for example polyglycol compounds of higher aliphatic amines.

The amount of the reaction product according to the invention (not counting solvent), relative to the weight of wool, is appropriately 0.5 to 5%, preferably 1.2 to 3%. The sequence of the two processes is optional, but in general it tends to be advantageous to carry out the dyeing first and the non-felting treatment afterwards, though it is also possible, as mentioned, to carry out the dyeing and non-felting treatment simultaneously in the same bath.

Furthermore it is also possible, in certain cases, to use the reaction products in an organic solvent directly, that is to say as a solution without dispersing agents. Possible solvents, with or without dispersing agents, are the same water-insoluble solvents as those which are described in connection with the manufacturing process.

As surface-active agents for the manufacture of the dispersed preparation of the reaction products, anionic or non-ionic surface-active compounds are advantageously used; in doing so care must be taken that these possess good solubility in the organic solvents which are used for the finishing process. Addition products of ethylene oxide to long-chain (generally of 12 to 24 carbon atoms) amines, alcohols, phenols or fatty acid esters are above all of particular interest.

Suitable representatives of surface-active compounds belong to the following types of compound: a) ethers of polyhydroxy compounds, such as polyoxalkylated fatty alcohols, polyoxalkylated polyols, polyoxalkylated mercaptans and aliphatic amines, polyoxalkylated alkylphenols and alkylphenols, polyoxalkylated alkylarylmecaptans and alkylarylamines, and also the corresponding esters of these compounds with polybasic acids, such as sulphuric acid or phosphoric acid, optionally also in the form of ammonium salts or amine salts; b) Fatty acid esters of the ethylene glycols and polyethylene glycols and of propylene glycol and butylene glycol, of glycerine and of polyglycerine and of pentaerythritol, as well as of sugar alcohols, such as sorbitol; and c) N-Hydroxyalkyl-carbonamides, polyoxalkylated carbonamides and sulphonamides.

As dispersing agents from these groups, which can advantageously be used, there may for example be mentioned:

The monoethanolamine salt of the phosphoric acid ester of the addition product of oleyl alcohol and 6 mols of ethylene oxide; the ammonium salt of the acid sulphuric acid ester of the addition product of 17 mols of ethylene oxide to oleyl alcohol, and the addition product of 4 mols of ethylene oxide to nonylphenol; the addition product of 8 mols of ethylene oxide to 1 mol of p-tert-octylphenol, of 15 or 6 mols of ethylene oxide to castor oil, of 20 mols of ethylene oxide to the alcohol  $C_{16}H_{33}OH$ , the ethylene oxide addition product to di- $\alpha$ -phenylethyl-phenols, polyethylene oxide-tert-dodecyl thioether, polyamine-polyglycol ether, the addition product of 15 or 30 mols of ethylene oxide to 1 mol of amine  $C_{12}H_{25}NH_2$  or  $C_{18}H_{37}NH_2$ , oleic acid triethylene glycol

ester, oleic acid polyethylene glycol 200 ester, oleic acid polyethylene glycol 400 ester, the adducts of 1 mol of oleic acid to 4 or 5 mols of ethylene oxide, the adduct of 4 mols of ethylene oxide to 1 mol of oleic acid sorbitane ester, and sorbitane monolaurate, sorbitane monopalmitate and sorbitane monostearate.

Mixtures of such surface-active compounds are also suitable.

The following manufacturing instructions and Examples further illustrate the present invention; percentages by weight.

#### Manufacturing Instructions

A) 282 g of a dimerised linoleic acid (1 acid equivalent) together with 153 g (0.8 epoxide group equivalent) of an epoxide formed from 2,2-bis-(4'-hydroxyphenyl)-propane and epichlorohydrin are warmed to 150°C internal temperature for 6½ hours, whilst stirring. A highly viscous, clear product having an acid number of 53 and an epoxide group content of 0 is obtained.

B) 282 g of a dimerised linoleic acid (1 acid equivalent) together with 172 g (0.9 epoxide group equivalent) of an epoxide according to Instruction A are warmed to 150°C internal temperature for 7½ hours whilst stirring. A highly viscous, clear product with an acid number of 36 and an epoxide group content of 0 is obtained.

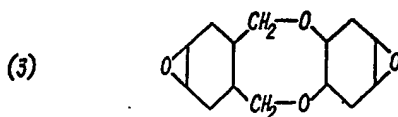
C) 141 g of a dimerised linoleic acid (=0.5 acid equivalent) together with 41.4 g of ethylene glycol diglycidyl ether (=0.45 epoxide equivalent) are warmed to 150°C internal temperature for 5½ hours whilst stirring. A highly viscous, clear product with an acid number of 65.7 and an epoxide group content of 0 is obtained.

D) 148 g of a mixture of 75% of dimerised linoleic acid and 25% of trimerised linoleic acid (=0.5 acid equivalent) together with 41.6 g of triglycidyl isocyanurate (=0.25 epoxide equivalent) are warmed to 120°C internal temperature for 1½ hours. A highly viscous product with an acid number of 99.5 and an epoxide group content of 0.3 is obtained.

E) 148 g of a mixture of 75% of dimerised linoleic acid and 25% of trimerised linoleic acid (=0.5 acid equivalent) together with 88.3 g (=0.45 epoxide group equivalent) of an epoxide formed from 2,2-bis-(4'-hydroxyphenyl)-propane and epichlorohydrin are warmed to 150°C internal temperature for 7 hours, whilst stirring. A highly viscous, clear product with an acid number of 64 and an epoxide group content of 0 is obtained.

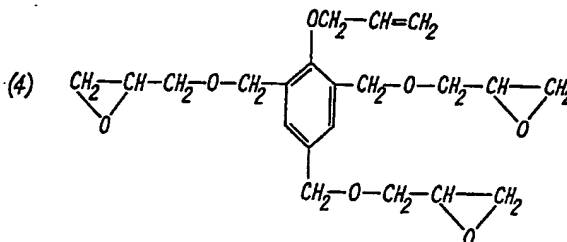
F) 148 g of a mixture of 75% of dimerised linoleic acid and 25% of trimerised linoleic acid (=0.5 acid equivalent) together with 66 g of hexahydrophthalic acid diglycidyl ester (=0.4 epoxide group equivalent) are warmed to 120°C internal temperature for 2 hours whilst stirring. A highly viscous, clear product with an acid number of 35.5 and an epoxide group equivalent of 0 is obtained.

G) 141 g of a dimerised linoleic acid (0.5 acid equivalent) together with 54.6 g of an epoxide of formula:



(0.35 epoxide group equivalent) are warmed to 150°C internal temperature for 1½ hours. A highly viscous, clear product with an acid number of 61.5 and an epoxide group content of 0 is obtained.

H) 141 g of a dimerised linoleic acid (0.5 acid equivalent) together with 40 g of an epoxide of formula



=0.25 epoxide group equivalent) are warmed for 2½ hours to 150°C internal temperature. A highly viscous, clear product with an acid number of 113 and an epoxide group content of 0.27 is obtained.

- 5 I) 141 g of a dimerised linoleic acid (0.5 acid equivalent) together with 78.5 g of the epoxide according to Manufacturing Instruction E (0.4 epoxide group equivalent) are warmed to 150°C internal temperature for 6½ hours whilst stirring. A highly viscous, clear product with an acid number of 59 and an epoxide group equivalent of 0 is obtained. 5

#### Example 1

- 10 77 g of a product manufactured according to Instruction B (0.05 acid equivalent) are dissolved in 66 g of n-butylglycol and are stirred, together with a solution of 6.2 g of a polyamide manufactured from polymerised linoleic acid and diethylenetriamine (0.025 amine equivalent) and 10 g of n-butylglycol, for 2 hours at 60°C. Thereafter the mixture is diluted with 248 g of n-butylglycol and further stirred until cold. A clear solution of 20% solids content is obtained. 15

#### Example 2

- 20 77 g of a product manufactured according to Instruction B (0.05 acid equivalent) are dissolved in 66 g of n-butylglycol and stirred, together with a solution of 12.35 g (0.05 amine equivalent) of the polyamide described in Example 1 and 15 g of n-butylglycol, for 2 hours at 60°C. Thereafter the mixture is diluted with 265 g of n-butylglycol and further stirred until cold. A clear solution of 20% solids content is obtained. 20

#### Example 3

- 25 77 g of a product manufactured according to Instruction B (0.05 acid equivalent) are dissolved in 66 g of n-butylglycol and stirred, together with a solution of 24.7 g (0.1 amine equivalent) of the polyamide described in Example 1, and 25 g of n-butylglycol, for 2 hours at 60°C. Thereafter the mixture is diluted with 298 g of n-butylglycol and further stirred until cold. 25  
A clear solution of 20% solids content is obtained.

#### Example 4

- 30 68 g of a product manufactured according to Instruction B (0.044 acid equivalent) are dissolved in 59 g of n-butylglycol and stirred, together with a solution of 32 g (0.13 amine equivalent) of the polyamide described in Example 1 and 32 g of n-butylglycol, for 4 hours at 60°C. 30  
Thereafter the mixture is diluted with 299 g of n-butylglycol and further stirred until cold. A clear solution of 20% solids content is obtained. 35

#### Example 5

- 40 77 g of a product manufactured according to Instruction B (0.05 acid equivalent) are dissolved in 66 g of n-butylglycol and stirred, together with a solution of 49.4 g (0.2 amine equivalent) of the polyamide described in Example 1 and 50 g of n-butylglycol, for 4 hours at 60°C. 40  
Thereafter the mixture is diluted with 373 g of n-butylglycol and further stirred until cold. A clear solution of 20% solids content is obtained.

#### Example 6

- 45 77 g of a product manufactured according to Instruction B (0.05 acid equivalent) are dissolved in 66 g of n-butylglycol and stirred, together with a solution of 62 g (0.25 amine equivalent) of the polyamide described in Example 1 and 70 g of n-butylglycol, for 2 hours at 60°C. Thereafter the mixture is diluted with 423 g of n-butylglycol and further stirred until cold. A clear solution of 20% solids content is obtained. 45

#### Example 7

- 50 74.4 g of a polyamide manufactured from polymerised linoleic acid and diethylenetriamine (=0.3 amine equivalent) are dissolved in 74.4 g of a dioxane and warmed to 40°C internal temperature. A solution of 42.8 g of a reaction product manufactured according to Instruction C (0.05 acid equivalent) and 42.8 g of dioxane is allowed to run in over the course of 30 minutes. Thereafter the mixture is stirred for a further 24 hours at 40°C and is then diluted with 275 g of dioxane. A clear, mobile solution of 20% solids content is obtained. 55

## Example 8

a) 187 g of polymerised fatty acid and 68.5 g of diethylenetriamine are introduced into a reaction vessel which is equipped with a stirrer, a thermometer, an inlet tube for nitrogen and a distillation head. The polymerised fatty acid, obtained by polymerisation of oleic acid, has the following properties: 95% dimerised oleic acid; equivalent weight 289.

The reaction mixture is heated to 200°C over the course of 1½ hours under nitrogen and whilst stirring, the elimination of water starting at 160°C internal temperature. After a further 2 hours at 200°C, a total of 13 parts of water are collected.

Thereafter the mixture is concentrated for 3 hours in vacuo (14 mm Hg) at 200 to 210°C. 210 g of a viscous, yellowish clear product with an amine equivalent weight of 296 are obtained.

b) 59.2 g of the product described under a) (=0.2 amine equivalent) are dissolved in 59.2 g of butylglycol and warmed to 120°C internal temperature. A solution of 28.2 g of a reaction product manufactured according to Instruction D (0.05 acid equivalent) and 28.2 g of butylglycol are allowed to run in over the course of 30 minutes. Thereafter the mixture is stirred for a further 2 hours and is then diluted with 260 g of butylglycol. A clear solution of 20% solids content is obtained.

## Example 9

87.7 g of a reaction product manufactured according to Instruction E (=0.1 acid equivalent) are dissolved in 87.7 g of dioxane and warmed to 80°C internal temperature. A solution of 24.8 g of a polyamide according to Example 7 (=0.1 amine equivalent) and 24.8 g of dioxane is then allowed to run in over the course of 30 minutes. 20 minutes thereafter, the mixture is diluted with 330 g of dioxane and further stirred until cold. A mobile solution of 20% solids content is obtained.

## Example 10

39.5 g of a reaction product manufactured according to Instruction F (=0.025 acid equivalent) are dissolved in 39.5 g of ethanol and warmed to 60°C internal temperature. A solution of 24.8 g of a polyamide (=0.1 amine equivalent) according to Example 7 and 24.8 g of ethanol is then allowed to run in over the course of 30 minutes. 2 hours thereafter, 190 g of ethanol are added and the mixture is further stirred until cold. A mobile solution of 20% solids content is obtained.

## Example 11

44.6 g of a polyamide according to Example 9 (=0.18 amine equivalent) are dissolved in 44.6 g of isopropanol and warmed to 60°C internal temperature. A solution of 30.4 g of a reaction product manufactured according to Instruction G (=0.033 acid equivalent) and 30.4 g of isopropanol is then allowed to run in over the course of 30 minutes. 2 hours thereafter the mixture is diluted with 225 g of isopropanol and further stirred until cold. A mobile liquid of 20% solids content is obtained.

## Example 12

44.5 g of a polyamide according to Example 8 a) (=0.15 amine equivalent) are dissolved in 44.5 g of butylglycol and warmed to 60°C internal temperature. A solution of 24.8 g of a reaction product manufactured according to Instruction H (=0.05 acid equivalent) and 24.8 g of butylglycol is then allowed to run in over the course of 30 minutes. After a further 2 hours, the mixture is diluted with 195 g of butylglycol and further stirred until cold. A mobile solution of 20% solids content is obtained.

## Example 13

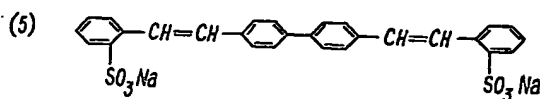
76 g of a reaction product according to Instruction I (=0.08 acid equivalent) are dissolved in 76 g of butylglycol and warmed to 60°C internal temperature. A solution of 9.9 g of a polyamide according to Example 7 (=0.04 amine equivalent) and 10 g of butylglycol is added thereto. 2 hours thereafter, the mixture is diluted with 255 g of butylglycol and further stirred until cold. A mobile solution of 20% solids content is obtained.

## Example 14

102 g of a product manufactured according to Instruction A (=0.1 acid equivalent) are dissolved in 102 g of butylglycol and warmed to 60°C internal temperature. After adding a solution of 12.4 g (=0.05 amine equivalent) of a polyamide according to Example 1 and 12.4 g of butylglycol, the mixture is stirred for 2 hours at 60°C internal temperature. Thereafter it is diluted with 330 g of butylglycol and further stirred until cold. A clear solution of 20% solids content is obtained.

## Example 15

3.0 g of a preparation according to Example 5, together with 0.4 g of the optical brightener of formula



5 and 5.0 ml of acetic acid are worked into a dough with 5.0 g of an adduct of 1 mol of p-tert-nonylphenol and 5 mols of ethylene oxide, and this mixture is then made up to 1000 ml with trichloroethylene. A stable dispersion is obtained by brief stirring. 20 g of bleached wool yarn are treated with this liquor at 50°C for one hour. Removal of excess liquor by centrifuging is followed by drying and fixing over the course of a further hour at 80°C.

The wool yarn thus treated is non-felting and shows a good brightening effect.

## Example 16

15 2.0 g of a preparation according to Example 2 are worked into a dough with 5.0 g of an adduct of 1 mol of p-tert-nonylphenol and 5 mols of ethylene oxide and this mixture is then made up to 1000 ml with perchloroethylene. A stable dispersion is obtained by brief stirring. 20 g of wool yarn are treated with this liquor for 60 minutes at 30°C. Removal of excess liquor by centrifuging is followed by drying and fixing at 80°C over the course of a further hour.

The wool yarn thus treated is non-felting.

## Example 17

20 3.0 g of a preparation according to one of Examples 7 to 14 are worked into a dough with 10.0 g of a surface-active agent of the composition given below, and this mixture is diluted to 1000 ml with perchloroethylene. A stable dispersion is obtained by brief stirring. 20 g of a knitted piece of wool are treated with this liquor for 50 minutes at 20°C. Removal of excess liquor by centrifuging is followed by drying and fixing at 100°C over the course of 10 minutes. The knitted piece thus treated is in each case non-felting.

The following products served as surface-active agents:

30 I: Condensation product of 1 mol of coconut fatty acid and 2 mols of diethanolamine, containing about 2% of water and about 2% of acetic acid.

II: Acid phosphoric acid ester of a condensation product of 1 mol of 2-ethylhexanol and 5 mols of ethylene oxide, neutralised with sodium hydroxide, in the form of an 80% strength aqueous solution.

35 III: Aqueous solution containing: 38.5% of an oleic acid polyglycol ester, 38.5% of a condensation product of 1 mol of p-tert-octylphenol and 8 mols of ethylene oxide and 15.5% of oleic acid.

## Example 18

40 2.0 g of a preparation according to one of Examples 7 to 14 are worked into a dough with 5.0 g of a surface-active agent of the composition indicated in Example 16, and this mixture is diluted to 500 ml with trichloroethylene. A stable dispersion is produced by brief stirring. 20 g of wool yarn are treated with this liquor for 40 minutes at 20°C. Removal of excess liquor by centrifuging is followed by drying and fixing at 90°C for 60 minutes. The wool yarn in each case acquires a non-felting finish.

## Example 19

45 16 g of a preparation according to one of Examples 7 to 14 are worked into a dough with 40 g of a surface-active agent of the composition indicated in Example 16, and diluted to 4000 ml with petrol (boiling range 150 to 195°C). A stable dispersion is produced on stirring. 200 g of a knitted piece of wool are treated with this liquor for 45 minutes at 50°C. Removal of the liquor by centrifuging is followed by drying and fixing over the course of a further 45 minutes at 80°C. The woollen knitted piece in each case acquires a non-felting finish.

50 Instead of petrol, cyclohexane can also be used as the solvent, with equal success.

## WHAT WE CLAIM IS:—

1. Process for the manufacture of a preparation comprising a polyepoxide reaction product which comprises reacting a) a reaction product of a') at least one polyepoxide which contains at least two epoxide groups per molecule, and a'') at least one polymeric, unsaturated fatty acid, the equivalent ratio of epoxide groups to acid groups being from 0.5:1 to 0.95:1, with b) a basic polyamide which is obtained by condensation of b') a polymeric unsaturated fatty acid and b'') a polyalkylenepolyamine, in the presence of an organic solvent at a temperature of 40 to 120°C., the equivalent ratio of acid groups of component a) to amino groups of component b) being from 1:0.4 to 1:6.
2. Process according to claim 1 in which the polyepoxide is derived from a bisphenol.
3. Process according to claim 1 or 2 in which component a') is a polyglycidyl ether of 2,2-bis-(4'-hydroxyphenyl)-propane.
4. Process according to claim 3 in which component a') has an epoxide content of at least 5 epoxide group equivalents per kg.
5. Process according to claim 3 in which component a') is a reaction product of epichlorohydrin with 2,2-bis-(4'-hydroxyphenyl)-propane.
6. Process according to any one of claims 1 to 5 in which component a'') is aliphatic, ethylenically unsaturated dimeric to trimeric fatty acid.
7. Process according to claim 6 in which component a'') is an aliphatic unsaturated monocarboxylic acid with 16 to 22 carbon atoms.
8. Process according to claim 7 in which component a'') is a dimerised to trimerised linoleic or linolenic acid.
9. Process according to any one of claims 1 to 8 in which component b') is an aliphatic, ethylenically unsaturated dimeric to trimeric fatty acid.
10. Process according to claim 9 in which component b') is an aliphatic unsaturated monocarboxylic acid with 16 to 22 carbon atoms.
11. Process according to claim 10 in which component b') is a dimerised to trimerised linoleic acid or linolenic acid.
12. Process according to any one of claims 1 to 11 in which component b'') is an aliphatic polyamine of formula:



- wherein n is equal to 1, 2 or 3.
13. Process according to any one of claims 1 to 12 in which the organic solvent is wholly miscible with water.
  14. Process according to one of claims 1 to 13 in which the reaction is carried out at 40° to 80°C.
  15. Process according to claim 1 substantially as hereinbefore described.
  16. Process according to claim 1 substantially as described in any one of Examples 1 to 19.
  17. A preparation whenever prepared by a process as claimed in any one of claims 1 to 16.
  18. Process for finishing textiles which comprises treating them with a preparation as claimed in any one of claims 1 to 17, dispersed in a water insoluble organic solvent, and a surface-active dispersing agent which is soluble in organic solvents, subsequently removing the solvent from the textiles thus treated, and optionally, subjecting the textiles to an aftertreatment.
  19. Process according to claim 18 in which the aftertreatment comprises storing the textiles at room temperature for a period of from 2—10 days or heat-treating them.
  20. Process according to claim 19 in which the heat treatment is carried out at 40° to 100°C.
  21. Process according to any one of claims 18 to 20 in which the textiles are treated in accordance with the exhaustion process.
  22. Process according to claim 21 in which the textiles are treated with the preparation at 20° to 80°C.
  23. Process according to any one of claims 18 to 22, in which a low molecular (as hereinbefore defined) aliphatic carboxylic acid is added to the preparation for the finishing of the textiles.
  24. Process according to any one of claims 18 to 23 in which the dispersing agent is a non-ionic or anionic compound obtained by the addition of ethylene oxide to a long-chain (as hereinbefore defined) amine, alcohol, phenol or fatty acid ester.



25. Process according to any one of claims 18 to 24 in which the solvent is a petrol hydrocarbon, benzene, halogenated benzene or benzene substituted by lower alkyl groups, an alicyclic hydrocarbon or a halogenated aliphatic hydrocarbon.
- 5 26. Process according to claim 25 in which the solvent is trichloroethylene or perchloroethylene. 5
27. Process according to any one of claims 18 to 26 in which the textile is wool which is rendered non-felting by the process.
28. Process according to claim 18 substantially as hereinbefore described.
- 10 29. Process according to claim 18 substantially as described in any one of Examples 15 to 19. 10
30. Textiles whenever finished by a process as claimed in any one of claims 18 to 29.

J. A. KEMP & CO.,  
Chartered Patent Agents,  
14, South Square,  
Gray's Inn, London, W.C.1.

Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1972.  
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from  
which copies may be obtained.